

REMARKS

Applicants wish to thank the Examiner for the careful consideration given this case. Claims 1-20 are pending in this case. Claims 1, 3, 4, 6-10, 13-14, and 16-20 are amended herein. Claims 11-12 are cancelled. This response addresses those issues raised in the Office Action mailed on August 20, 2003. Applicants request that the Examiner consider the remarks and amendments presented herein. It is submitted that, as they currently stand, the claims are in condition for allowance. Communication to this effect is respectfully requested.

Applicants thankfully acknowledge the statement by the Examiner that Claim 2 contains allowable subject matter. Claim 2 has been objected to as being dependent upon a rejected independent claim (Claim 1). It is respectfully submitted that, based upon the arguments and amendments presented herein, Claim 1 is now in allowable form and that this objection may be withdrawn.

The Examiner notes that the Abstract of the pending application contains inappropriate language and is too long. Applicants have submitted a replacement Abstract for the Examiner's consideration. It is respectfully submitted that no new matter has been introduced by this replacement.

The Examiner objects to Claim 13 because of improper antecedent basis for the phrase "the residue." Applicants have amended Claims 1 and 13 to address this concern of the Examiner. Reconsideration and withdrawal of this objection is respectfully requested.

The Examiner rejects Claims 3, 8, and 18 under 35 U.S.C. § 112, ¶2 as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended Claims 3, 8, and 18 to address the concerns of the Examiner. Reconsideration and withdrawal of these rejections is respectfully requested.

The Examiner rejects claims 1, 3-10, and 13-20 under 35 U.S.C. § 103(a) as being unpatentable over Tokuoka et al. (U.S. Patent No. 5,849,597; the '597 patent). The Examiner asserts that although the '597 patent does not disclose sulfuric acid, it would have been obvious to one of skill in the art to modify the '597 patent by adding the known sulfuric acid to test various types of impurity in a silicon substrate. Applicants strenuously disagree with this characterization by the Examiner.

Even if sulfuric acid were known as a chemical, adding sulfuric acid to an acid mixture of hydrofluoric acid and nitric acid as presently claimed is not at all obvious. There is absolutely no suggestion within the '597 patent or the art for such a combination. Indeed, the addition of sulfuric acid gives rise to multiple unexpected results and properties, including:

- (a) Sulfuric acid absorbs the moisture associated with hydrofluoric acid and nitric acid in the decomposing solutions;
- (b) Sulfuric acid absorbs moisture in the closed headspace within the reaction vessel, thereby reducing the relative humidity in the headspace;
- (c) The moisture absorption detailed in (a) and (b) above accelerates the vaporization of the decomposing solution and makes it possible to obviate the need for heating or pressurizing the reaction vessel; and
- (d) The highly concentrated HF-HNO₃ gas that is vaporized from the decomposing solution comes into contact with a silicon substrate into a sublimate in a comparatively short period of time.

These advantages are clearly described in the pending application at Page 4, line 22 to Page 5, line 10.

As evident from (a) and (b) above and as claimed in Claim 1, the reaction vessel used in the present invention does not require tight sealing, thick walls, or a domed/curve shaped ceiling which are indicative of a pressurized reaction vessel. In contrast, the '597 patent reaction vessel must have a sealed state adapted for pressurization (column 13, lines 34-35), and thus have walls with a considerable thickness of about 10-20 mm (column 10, line 60). Moreover, because a large number of droplets develop on the ceiling surface of the reaction vessel, a ceiling portion of the container is designed to be curved in shape in order to prevent droplets from falling on the sample (column 10, lines 4-13).

As evident from (c), the present reaction vessel claimed in Claim 1 does not require heating or pressurizing, where as the '597 patent's reaction vessel is preferably heated (column 11, line 3) and adapted to be able to keep an inner space (S in Fig. 3) at a pressure of 0.101 to 0.5 MPa (column 4, lines 64-65). The '597 patent clearly employs a pressure-based vapor-phase decomposing method and apparatus.

All of these observations clearly highlight the differences between the '597 patent and the claims of the pending application. These differences are due in large part to the novel and unobvious addition of sulfuric acid to the acid mixture. Indeed, by teaching a pressurized and heated reaction vessel, the '597 patent teaches away from the limitation found in Claim 1 of "without requiring the reaction vessel to be heated and pressurized" (Claim 1, and the dependent Claims 2-10 and 13-20). As the Examiner is aware, a *prima facie* case of obviousness may be successfully rebutted by showing that the cited art, in any material respect, teaches away from the claimed invention. *In re Geissler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997) MPEP 2144.05.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the present obviousness rejection.

With respect to Claims 3-4, 6-7, 9-10, 13-14, 16-17, and 19-20, the Examiner further asserts that the '597 patent does not disclose heating the solution to 60-90 degrees Celsius and that it would be obvious as a design choice to modify Tokuoka et al. to heat the solution to different temperature levels for different purposes. Applicants strongly disagree with the Examiner on this point.

Heat treatment of the present invention as claimed in Claims 3-4, 6-7, 9-10, 13-14, 16-17, and 19-20, aims to allow a residue to sublime, whereas the heat treatment of the '597 patent aims to decompose a silicon substrate. In the presently-claimed invention, the recovered decomposition residue with the acid mixture is heated to 60-90 degrees Celsius or 150-220 degrees Celsius for sublimation, whereas in the '597 patent the decomposing solution is heated (*see* column 9, lines 67 to column 10, line 2). The heat treatment of the presently-claimed invention is quite different from that of the '597 patent, both in purpose and in result. Indeed, by teaching heating to the decomposing solution, the '597 patent teaches away from the present claims which are directed to heating the recovered decomposition residue. Accordingly, the Examiner's use of the '597 patent is inappropriate. Reconsideration and withdrawal of the present obviousness rejection is respectfully requested.

In addition, the Examiner's rejection does not at all address the claim limitation of heating to 150-220 degrees Celsius as found in Claims 4, 7, 10, 14, 17, and 20. To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested in the cited references. MPEP § 2143.01. This obviousness rejection clearly fails for Claims

4, 7, 10, 14, 17, and 20. Reconsideration and withdrawal of this rejection is respectfully requested.

With respect to Claims 5 and 15, the Examiner asserts that the skilled artisan would have been motivated to modify Tokuoka's system with the fluorine resin plates to facilitate testing. Not only is the Examiner using impermissible hindsight in generating this rejection, the Examiner does not cite a reference to support this rejection. Nor does the Examiner assert that the combination would have two plates of fluorine resin, that the plates have the same diameter, that the diameter is a little smaller than that of the wafer, and that the assembly is placed on the support – all claim limitations of Claims 5 and 15. Thus, each and every claim element is not taught by this rejection of the Examiner. As the Examiner is aware, to establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested in the cited references. MPEP § 2143.01. This obviousness rejection clearly fails and is wholly inappropriate. Reconsideration and withdrawal of this rejection is respectfully requested.

Regarding the Examiner's rejection of Claims 8 and 18, the Examiner again does not assert that the cited art contains each and every limitation of Claims 8 and 18. For example, the Examiner does not assert that the beakers are made of a fluorine resin or that the beakers are placed on the support. As the Examiner is aware, to establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested in the cited references. MPEP § 2143.01. This obviousness rejection clearly fails and is inappropriate. Reconsideration and withdrawal of this rejection is respectfully requested.

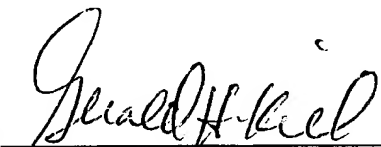
In view of the remarks presented herein, it is respectfully submitted that the present application is in condition for final allowance and notice to such

effect is requested. If the Examiner believes that additional issues need to be resolved before this application can be passed to issue, the undersigned invites the Examiner to contact him at the telephone number provided below.

Respectfully submitted,

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By



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